



Hours of Work at Sea: An Empirical Analysis

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Background

- Standard workweek and billet requirements
 - Assumes 67 hours per week
 - $\# \text{Billets} = \text{weekly workload}/\text{standard workweek}$
- Quality of service and retention
- Last studies 1975 to 1979

The Navy Standard Workweek



Activity	Hours per week
On-duty time	81
Productive work	67
Training & drills	7
Other duty (service diversion)	7
Non-available time	87
Sleeping	56
Messing	14
Personal needs	14
Sunday free time	3

Questions



- How do sailors spend their time at sea?
- Do actual hours match the standard?
- What effect does manning have on hours worked?

Changes Since The 1970's

- Technology
 - Email
 - Automated banking services
 - Worker productivity
- Policies and programs
 - Qualification for enlisted surface warfare pin
 - Physical fitness standards
- Quality of sailors—higher education & aspiration

Measuring Today's Workweek at Sea

- Interviews
- Relevant setting
 - Forward deployed
 - Steaming in Condition III
- Broad sample
 - Mix of ratings, paygrades, departments, ship types
 - Both LANT and PAC fleets

Interview Methodology

- Steps to mitigate self-selection
 - Reach respondents in work environment
 - Interview all sailors in work group, *or*
 - Random sample from roster
- Steps to mitigate reporting error
 - One-on-one
 - Open-ended—they say what they did, we code it
 - Short, definite recall period of 24-hours

Ships and Interviews



Ship	Location	Perce nt of crew	Responde nts	Intervie ws
LHD	Med	29%	294	361
LSD	Med	40%	121	139
CVN	Indian Ocean	10%	284	364
DDG	Indian Ocean	22%	67	108
CG	Indian Ocean	30%	101	127
Total		100%	867	1,000

Selected Activity Categories



Category	Examples
Watch	Stood watch, turned over watch, on-call (except medical staff). Includes all activities during watch period.
Ship's work	Maintenance, "sweepers," "divisional work," painting, supervising, administrative tasks, preparing meals, providing medical care
Training	Giving or receiving training. BECCEs, helo crash drills, "in-rate training," "professional study," damage control team training, quality assurance training
Other duty (service diversion)	"Quarters," getting a haircut, sick call, attending a port brief, giving a tour to visitors, inspections, participation on committees
Personal needs	PT, enlisted surface warfare pin, advancement exam, PACE Recreation, religious services

The Workweek at Sea: Standard and Actual



■ Act. > St.

■ Act. < St.

Activity	Standard	Actual (N=864)
On-duty time	81	81
Productive work	67	74*
Training & drills	7	3*
Other duty	7	4*
Non-available time	87	87
Sleeping	56	49*
Messing	14	10*
Personal needs/sun	17	28*

*Statistically different from Standard value with 99% confidence.
Other categories tested on raw daily data.

Uneasy Fit For Some Activities



Activity*	Average weekly hours	Baseline category	Alternate category
Evolutions	4.5	Work	Training
Email	1.7	Personal needs	Work
Trips to store and post office	0.4	Personal needs	Work, other duty
Education—career or PACE	3.2	Personal needs	Training
PT	2.8	Personal needs	Other duty
Total	12.1	Total GQ (Condition I) allocated to one of these categories based on activities reported before and after GQ.	

Impact of Alternative Categories



Act. > St.

Act. < St.

Activity	Standard	Lower bound	Upper bound
On-duty time	81	76	93
Productive work	67	70	76
Training & drills	7	3	10
Other duty <small>(service diversion)</small>	7	4	7
Non-available time	87	79	87
Sleeping	56	49	49
Messing	14	10	10
Personal needs/Care	17	20	28

An Alternative Breakdown of the Workweek



Activity*	Weekly hours	Activity	Weekly hours
Watch+ ship work	69.7	Education	3.2
Evolutions	4.5	Sleeping	49.0
Training & drills	3.0	Messing	9.6
Other time on-duty	4.2	Other personal time	20.1
Email	1.7	Store/post office	0.1
PT	2.8	Total	168

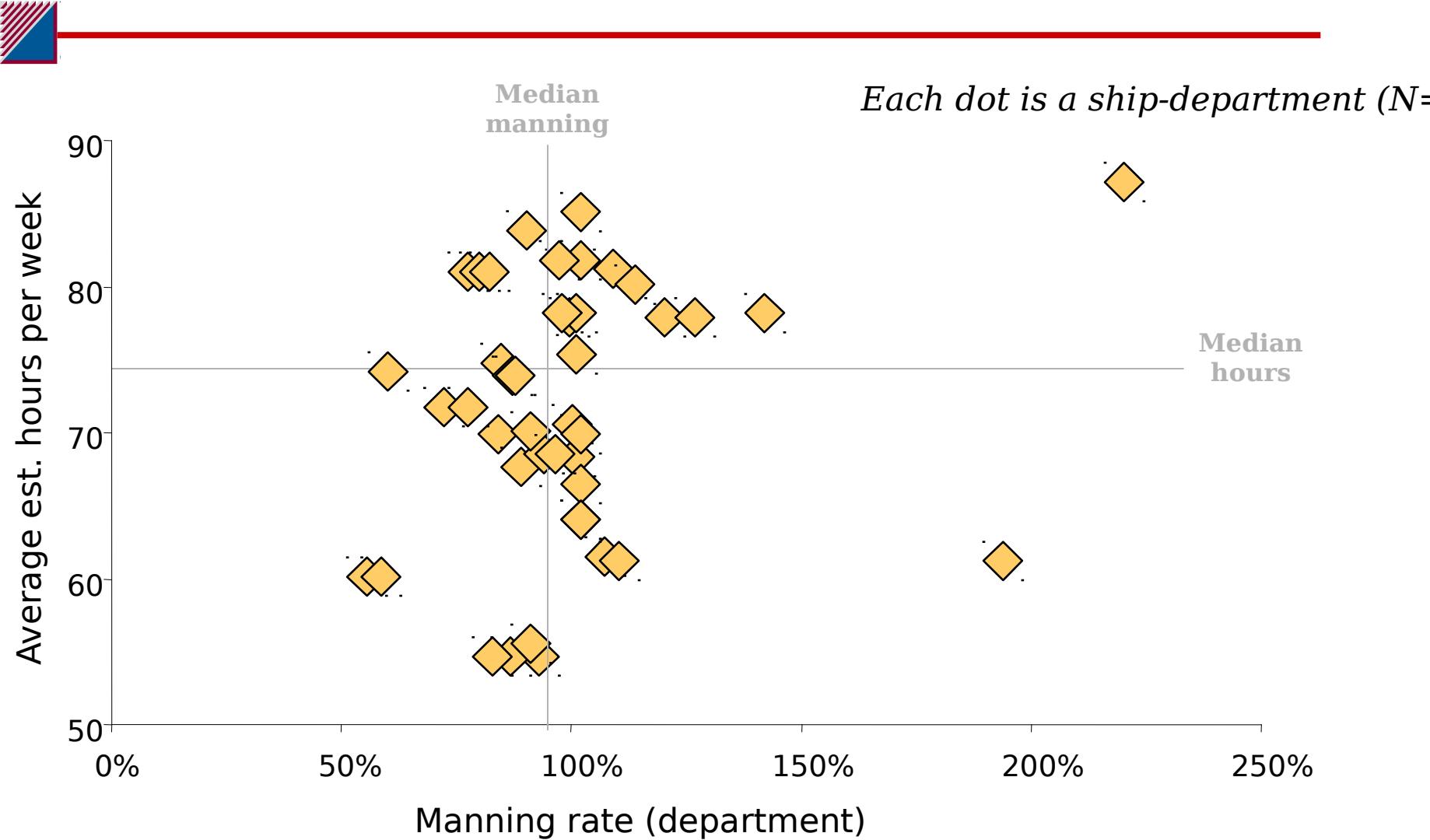
*Time in GQ (Condition I) allocated to one of these categories based on activities reported before and after GQ.

Queues

- Average time per day only 15 minutes
- However there are cases of very long waits
 - 1 hour in the smoking line
 - 1 hour for a meal
 - 90 minutes overall
- On LHD, meal lines a problem when Marines onboard
- On CVN, 10% spent 45 minutes/day or more in meal line---equivalent to 23 billets
 - Data understates effect of queues because sailors skip meals when lines are too long

Hours of Work and Manning

Illustration Using Departmental Averages



How Manning Affects Hours of Work

- Undermanning does not explain work over 67 hours
 - On average, changing (department or rating) manning from 91% to 100% would reduce weekly productive work time by 0 to 40 minutes
- Possible explanations
 - Resource sponsors set priorities
 - CO substitutes personnel in undermanned areas
- What does correlate with hours
 - Sunday (negative)
 - Equipment down (positive)
 - Paygrade E-6/E-7 (positive)

Conclusions

- Data consistent with standard workweek in many respects
 - Split between on-duty time and off-duty time
 - Amount of training and service diversion
- However, actual productive work hours exceeds standard
- Full manning will not bring hours in line
- Old classification system may not meet today's needs
- Can improve both QoL and productivity by reducing mess lines